

Claims

Level

- 5 1. A level comprising a level body (10) produced by injection molding thermoplastic material, which body has at least one recess (22) for a position sensor, such as a bubble level (37), as well as a reinforcing insert (29, 31, 32, 33, 34, 35, 36, 38, 39, 40, 41, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68), which is overmolded at least in areas with thermoplastic material, is made of fiber-reinforced plastic and is materially connected with the level body at least in some areas.
- 10 2. A level according to Claim 1, characterized in that the reinforcing insert (29, 31, 32, 33, 34, 35, 36, 38, 39, 40, 41, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68) is made of a carbon fiber or glass fiber reinforced plastic, particularly a plastic with fibers, such as rovings or textile semi-finished products, which extend as a unit across the entire or substantially the entire length
- 15 of the reinforcing insert.
3. A level according to Claim 1 or 2, characterized in that the reinforcing insert (29, 31, 32, 33, 34, 35, 36, 38, 39, 40, 41, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68) extends along the longitudinal axis of the level body (10) and across its entire or substantially entire length and
- 20 particularly along the upper and/or lower longitudinal edge area, which is defined on the exterior side by the measurement base (17) of the level body (10).
4. A level according to Claim 1, characterized in that the level body (10) is made of a fiber-reinforced, such as a short or long fiber-reinforced plastic, the plastic of the level body preferably
- 25 matching the plastic of the reinforcing insert (29, 31, 32, 33, 34, 35, 36, 38, 39, 40, 41, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68).
5. A level according to at least one of the preceding claims, characterized in that first and second reinforcing inserts (44, 46) or sections of a reinforcing insert extend in the longitudinal axis

direction of the level body (10), when viewed in front of and behind the recess (22) starting in the area opposite the measurement base.

6. A level according to at least one of the preceding claims, characterized in that third and fourth reinforcing inserts extend above and/or below and on both sides of the recess (22) in the level body (10).

7. A level according to at least one of the preceding claims, characterized in that the first and/or second reinforcing inserts (44, 46) are connected, such as welded, to the third and/or fourth reinforcing inserts (48, 50).

8. A level according to at least one of the preceding claims, characterized in that the third and/or fourth reinforcing strips, which extend along the sides of the recess (22), overlap at least in sections the first and second reinforcing strips (44, 46) in the longitudinal direction of the level body (10).

9. A level according to at least one of the preceding claims, characterized in that the reinforcing strip has two first sections (56, 58) extending in the longitudinal axis direction and along each side of the recess (22), which sections are connected to the second sections (60, 62, 64, 66) extending in a transverse manner to them.

10. A level according to at least one of the preceding claims, characterized in that the level body (10) has the geometry of an I-profile with upper and lower flanges (14, 16) and the rib (12) connecting the flanges and that a reinforcing insert (32) extends in at least one flange.

11. A level according to at least one of the preceding claims, characterized in that a first reinforcing insert (68), preferably in the form of a T-profile, is molded in the level body in the longitudinal direction of the level body (10) when viewed in front of and behind the recess (22) for the position sensor starting from the exterior area (23) of the narrow side of the level body

opposite the measurement base (17), and that the first reinforcing inserts are connected to at least a second reinforcing insert (70, 72) extending to the side of the recess and/or below the recess.

12. A level according to at least Claim 11, characterized in that the second reinforcing insert extending beneath the level bubble that is positioned in an offset manner in the direction of the exterior area (23) and is also placed in the recess (22).

13. A level according to at least one of the preceding claims, characterized in that the reinforcing insert (29, 31, 32, 33, 34, 35, 36, 38, 39, 40, 41, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68) has a modules of elasticity with $E \gg 80$ GPa, in particular $E > 200$ GPa, preferably $E > 400$ GPa.

14. A level according at least to Claim 11, characterized in that the rib (12) connecting the flanges (14, 16) has a wave-shaped geometry in a cut view along its flanges.

15. A level according at least to Claim 11, characterized in that the reinforcing insert (29, 31, 32, 33, 34, 35, 36, 38, 39, 40, 41, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68) and the level body (10) have the same matrix, particularly being made of or comprising polyamide.

16. A level according at least to Claim 11, characterized in that the level is constructed in a symmetrical manner with regard to the arrangement of the reinforcing inserts (29, 31, 32, 33, 34, 35, 36, 38, 39, 40, 41, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68).